REMARKS

I. Status of the claim

Claim 1 is pending in the application.

No amendment has been made.

II. Rejections under 35 U.S.C. § 103(a)

Applicants' claimed invention achieves a compact high performance oil pump having many advantages over pumps of the prior art. Specification, p. 3, ll. 2-3. Applicants' claimed Si/So ratio of 0.8 to 1.3 results in "hydraulic pulsation [that] can be restrained while at the same time discharging capacity is increased" in pumps having a small number of teeth. Specification, p. 13, ll. 15-16. Additionally, Applicants claimed Si/So ratio range results in "a sufficient discharging performance, . . . , [that] can be obtained even when dimensional accuracy of the rotors and the casing is degraded more than that in a conventional oil pump, and thus manufacturing cost of the oil pump rotor assembly can be reduced." Specification, p. 13-14, ll. 22-2.

Claim 1 is rejected under 35 U.S.C. § 103(a) as unpatentable over Figure 4 of the application, which is admitted prior art, and U.S. Patent No. 5,876,193 to Hosono et al. ("Hosono"). The Examiner states that Figure 4 "discloses an internal gear oil pump rotor assembly comprising: an inner rotor (40) having 'Zi' external teeth; an outer rotor (50) having 'Zo' internal teeth; wherein the oil pump rotor assembly including a suction port (31) and discharge port (32); wherein the number of teeth 'Zi' of the inner rotor is set to be equal to or fewer than '6.'" Office Action, dated January 10, 2005, p. 3, ll. 6-10. However, the Examiner acknowledges that the "admitted prior art fails to disclose a range of the Si/So ratio is between 0.8 to 1.3." Office Action, dated January 10, 2005, p. 3, ll. 10-11. The Examiner contends that this range would have been obvious since the use of

Applicants' claimed range, as taught by Hosono, would have reduced resistance and improved efficiency of the oil pump device. Office Action, dated January 10, 2005, p. 3, ll. 18-20. Applicants respectfully traverse this rejection.

Applicants submit that Figure 4 of Applicants' Specification teaches a Si/So ratio of 0.618 as distinguished from Applicants' claimed Si/Si ratio of 0.8 to 1.3, and that Hosono does not teach or suggest Applicants' claimed Si/Si ratio. Specification, p. 5, ll. 3-5; Figure 4. Applicants' claimed Si/So ratio accounts for the individual relative surface areas of the external and internal rotor teeth. Indeed, the only ratio Hosono teaches is an H_i/E_i ratio accounting for the relative sizes of the diameters of circles which roll along the outside or inside of the base circles where "$_i$" represents the inner rotor. Hosono, cols. 1-2, ll. 67-3. Accordingly, Applicants submit that one of ordinary skill is not taught or motivated by Figure 4, separately or in combination with Hosono, to experiment with the relative surface areas of rotor teeth according to any ratio set forth in Hosono.

Further, Applicants submit that Hosono's limited discussion of the relative tooth surface area of external and internal teeth teaches away from Applicants' claimed use of a range Si/So ratio of 0.8 to 1.3. In Applicants' invention, "Si is a cross-sectional area of one external tooth" on an inner rotor and "So is a cross-sectional area of one internal tooth" on an outer rotor. Specification, pp. 3-4, ll. 22-2. Accordingly, when compared with the conventional Si/So ratio of 0.618 as taught in Applicants' Figure 4, Applicants' claimed ratio represents a decrease in the size of the surface area of an external tooth on an inner rotor relative to the surface area of an internal tooth on an outer rotor. By contrast, the Hosono reference teaches that decreasing the size of the external tooth on an inner rotor relative to the internal tooth on an outer rotor causes "the frictional torque T to increase as a result." Hosono, col. 4, ll. 36. Thus, one of ordinary skill in the art would understand Hosono

to suggest that Applicants' claimed Si/So ratio of 0.8 to 1.3 would lead to an undesirable increase in frictional torque.

Further, Hosono's objective is to reduce resistance while at the same time ensuring the oil pump rotor's durability and reliability, but Hosono is silent on achieving this objective by using a Si/So ratio that is between 0.8 to 1.3. *See* Hosono, col. 1, ll. 52-56. Indeed, Hosono achieves this objective by using an H_i/E_i ratio and a rotor "combining an epicycloid curve and a hypocycloid curve" constructed so as to reduce resistance generated by the sliding components. Hosono, col. 1, ll. 59-60; *see* col. 1, ll. 53-55. Applicants submit that one of ordinary skill in the art is not taught or motivated by Hosono's use of an H_i/E_i ratio and epicylcoid and hypocycloid curves to experiment with Applicants' Si/So ratio to achieve the compact high performance oil pump obtained by Applicants' claimed invention. Specification, p. 3, ll. 2-3.

The Examiner also cites *In re Aller*, 105 U.S.P.Q. 233, 235 (CCPA 1955) to support her argument that "where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art." Office Action, dated January 10, 2005, p. 4, ll. 1-3, 12-14. However, the Examiner points to no prior art references to support her argument that the "general conditions" of Applicants' claim would render obvious Applicants' claimed Si/So ratio of 0.8 to 1.3. Applicants respectfully submit that the Examiner's reliance on *In re Aller* is misplaced.

In re Aller dealt with a process patent for decomposing isopropyl benzene hydroperoxide which produced more phenol and acetone than did those processes cited in the prior art. The patent in *In re Aller* accomplished this result by modifying acid concentrations and temperatures used in the prior art. The court concluded that the process patent was rendered obvious because the result of

greater production of phenol and acetone was merely different from the results obtained by the prior art in degree, not in kind. *See id.* at 235 (emphasis added). Nonetheless, the court determined that particular ranges may be patentable where the Applicant shows the "criticality" of a claimed range, i.e., that the claimed range produces a new and unexpected result different in kind and not merely in degree from the results of the prior art. *See id.* Applicants submit that the claimed range of the Si/So ratio between 0.8 to 1.3 is a patentable "critical" range because the results obtained by the invention are unexpected and different in kind from those obtained in the cited prior art and that, therefore, *Aller* is inapplicable. *See Aller*, at 235.

The Examiner cites no prior art teaching or suggesting Applicants' claimed critical Si/So ratio to achieve results comparable to the reduced hydraulic pulsation, decreased cost, and increased longevity of Applicants' invention. Specification, p. 13-14, ll. 15-2. Applicants' claimed Si/So ratio between 0.8 to 1.3 results in "hydraulic pulsation [that] can be restrained while at the same time discharging capacity is increased" in pumps having a small number of teeth. Specification, p. 13, ll. 15-16. Additionally, Applicants' claimed Si/So ratio range results in "a sufficient discharging performance, . . . , [that] can be obtained even when dimensional accuracy of the rotors and the casing is degraded more than that in a conventional oil pump, and thus manufacturing cost of the oil pump rotor assembly can be reduced." Specification, p. 13-14, ll. 22-2. By contrast, Hosono teaches only "reducing the resistance that is generated by each of the sliding components in the inner and outer rotors and the casing" by using an inner rotor having "an epicycloid curve and a hypocycloid curve." Hosono, col. 1, ll. 59-65. Consequently, Applicants' provision of a rotor assembly in which the Si/So ratio of the areas of the rotor teeth is between 0.9 and 1.3 achieves

results that are different in kind, not merely in degree, from those accomplished by use of the prior art device.

In view of the above arguments, Applicants assert that one of ordinary skill in the art at the time the invention was made would not have been taught or motivated to experiment in the range disclosed and claimed by the Applicants as the preferable Si/So ratio. Applicants respectfully request that the rejection be withdrawn and the application allowed.

III. Examiner's Response to Applicant's Arguments Made in Response to the Office Action dated July 20, 2004

The Examiner contends that "[s]ince applicant[s] [sic] failed to traverse the Rejection of claim 1 based on the reference to APA (Fig. 4) in view of legal precedent, it is presumed that applicant[s] ha[ve] [sic] acquiesced the Rejection." Office Action, dated January 10, 2005, p. 4, ll. 8-9.

Applicants note that the Office Action dated July 20, 2004 rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over admitted prior art (Fig. 4) in view of Hosono. Office Action, dated July 20, 2004, p. 3, ll. 16-17. Applicants respectfully assert that Applicants traversed this rejection in their Response to the Office Action dated October 20, 2004, and that the fact that they did not specifically mention Figure 4 does not mean that they did not traverse the rejection. Accordingly, Applicants respectfully request that the presumption be withdrawn.

CONCLUSION

In view of the above argument, Applicants believe the pending application is in condition for allowance and respectfully request that the application be allowed.

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Respectfully submitted,

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